

francs), for a work concerning geology, or, failing that, mineralogy; the Fontannes prize (2000 francs), for the best publication on palæontology; the Alhumbert prize (1000 francs), for a memoir on the period of the last volcanic eruptions in France.

Botany.—The grand prize of the physical sciences (3000 francs); the question proposed is the demonstration of the various modes of formation and development of the egg in the Ascomycetes and the Basidiomycetes. The Desmazieres prize (1600 francs), for the best work published during the preceding year on Cryptogams; the Montagne prize (1500 francs), for work having for its object the anatomy, physiology, development, or the description of the lower Cryptogams; the Thore prize (200 francs) for work on the cellular Cryptogams of Europe.

Anatomy and Zoology.—The Savigny prize (1300 francs), for the assistance of young travelling zoologists, not receiving Government assistance, who have especially occupied themselves with the invertebrates of Egypt and Syria.

Medicine and Surgery.—A Montyon prize (2500 francs and a mention of 1500 francs), for works and discoveries useful in the art of healing; the Barbier prize (2000 francs), for a valuable discovery in surgical, medical, or pharmaceutical science, or in botany having relation with medicine; the Bréant prize (100,000 francs), for the discovery of an absolute specific against Asiatic cholera, or to point out in an irrefutable manner the causes of Asiatic cholera, so that the suppression of the disease will follow. Failing the award of the capital sum, the annual interest will be given for a rigorous demonstration of the existence in the atmosphere of matter capable of playing a part in the production or propagation of epidemic diseases. The Godard prize (1000 francs), for the best memoir on the anatomy, physiology, and pathology of the genito-urinary organs; the Baron Larrey prize (750 francs), for the best work dealing with the subject of military medicine, surgery, or hygiene; the Bellion prize (1400 francs); the Mège prize (10,000 francs); the Serres prize (7500 francs), for a memoir on general embryology applied as far as possible to physiology and medicine; the Dugate prize (2500 francs), for the best work on the diagnosis of death and the prevention of premature burial.

Physiology.—A Montyon prize (750 francs), and the Philipeaux prize (900 francs), for work in experimental physiology; the Lallemand prize (1800 francs), for work on the nervous system; the Pourat prize (1000 francs), for an essay on the origin of muscular glycogen.

Statistics.—A Montyon prize (500 francs), for a memoir on French statistics.

Among the general prizes offered in 1905 are the following:—the Binoux prize (2000 francs), for a work on the history of science; the Trémont prize (1100 francs), the Giegner prize (3800 francs), the Lannelongue prize (1200 francs), the Wilde prize (4000 francs), the Saintour prize (3000 francs), the Petit d'Ormay prizes (two of 10,000 francs), all for work useful in the promotion of scientific knowledge. Of these prizes those bearing the names of Pierre Guzman, Lalande, Tchihatchef, La Caze, Delesse, and Desmazières are especially mentioned as being awarded without distinction of nationality.

GEOLOGICAL NOTES.

VERY little geological information appears to have been published on the State of Durango, in western Mexico. The observations therefore recorded during a brief journey by Dr. O. C. Farrington are of considerable interest (Field Columbian Museum, No. 89, geological series, vol. ii., No. 5). His route extended from the city of Durango, which is situated upon an alluvial plain hemmed in by low and rugged hills, to the silver-mining town of Villa Corona or Ventanas, distant about seventy miles in a direct line. The ground, which forms part of the interior plateau of Mexico, rises from about 6000 feet at Durango to 9000 feet. While large tracts of the area are semi-arid and sparsely covered with soil and vegetation, in some places corn is successfully grown, and elsewhere there occur extensive pine forests with caks. Views of the scenery are given. Eruptive rocks prevail, and near the Ciudad ranch, on one of the highest parts of the plateau, there is a tract of

weathered masses known as La Ciudad de Rocas ("The City of Rocks"). The outlines of the rocks are domed and rounded, and they appear to be due to the weathering of fairly homogeneous rhyolitic materials.

Particular attention is directed by the author to the famous Cerro Mercado or Iron Mountain, a hill largely made up of solid iron-ore, and situated less than a mile north-east of Durango City. It rises abruptly from the alluvial plain to an average height of about 300 feet, with single peaks 50 feet to 100 feet higher. The length of the hill is about $1\frac{1}{2}$ miles, and its average width about one-third of a mile. The ore appears to be chiefly hæmatite, although some magnetite also occurs; in physical characters it varies, being hard and soft, black, red, specular, and earthy. Hard, solid black ore, however, forms the chief mass of the "mountain," the black colour being in striking contrast to the yellow and green of the surrounding plain. The ridge is almost bare of vegetation, except for straggling cacti, and its outline is bold and rugged. Steep cliffs 10 feet to 20 feet high are not infrequent, and in places they exhibit a distinct columnar structure like that of basalt (see Fig. 1). The existence of this hill appears to have been made known in 1552 A.D. but the first serious attempt to work the iron-

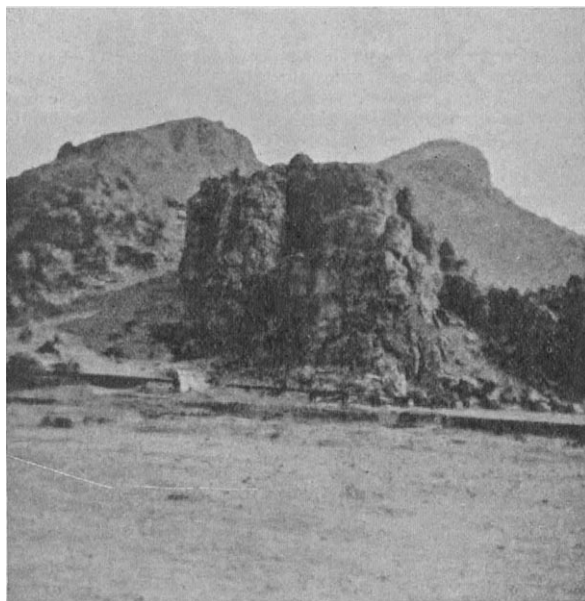


FIG. 1.—Cliff showing columnar structure of iron-ore at western end of the Cerro Mercado or Iron Mountain of Durango, Mexico.

ore was made in 1828. Successful operations were not conducted until 1888, and only within the last five years has a steady production been maintained. The amount of ore exposed above the level of the plain is estimated at 360 million tons. The author briefly discusses the origin of the iron-ore, regarding it as probably igneous. The associated rocks of the district are rhyolites, probably of later Tertiary age, but the relation, either in time or manner of origin, between the associated eruptive rock and the iron-oxide, and the origin of the iron-oxide itself, seem as yet difficult to determine.

A geological description of the Baraboo iron-bearing district of Wisconsin, by Dr. Samuel Weidman, has been issued by the Wisconsin Geological and Natural History Survey (*Bulletin* No. 13, economic series No. 8). The area is formed mainly by pre-Cambrian quartzites, which stand out in bold north and south ranges, so connected both on the east and west as to constitute a cordon of bluffs enclosing a depressed drift-covered interior. Isolated areas of still older rocks, rhyolite, granite, and diorite, occur along the outer borders of the ranges. Potsdam sandstone is found beneath the drift, and on the slopes of the Baraboo quartzites, while later Palæozoic strata are met with at higher levels. Special interest has recently been aroused by

the discovery of large deposits of iron-ore beneath the drift-covered valley, a discovery made while digging or drilling the farm wells in this otherwise well settled agricultural district. The iron-bearing rocks, termed the Freedom formation, from the town of North Freedom, comprise slate, chert, dolomite, and iron-ore, and all gradational phases between these kinds of rock, including banded ferruginous chert like that in the iron-bearing series of Lake Superior. The author points out that the Baraboo pre-Cambrian series may be compared with the upper portion of the Lower Marquette series, the Freedom formation corresponding with the Negaunee iron-bearing formation. Detailed accounts are given of the various rocks and drift deposits, and of the circulation of underground water.

The recent numbers of the *Boletín del Cuerpo de Ingenieros de Minas del Perú*, issued during 1904, continue to testify to the energy and activity of the Government officers charged with the development of Peru. No. 8, by Señor Venturo, describes important deposits of hæmatite in the extreme north of the country, the ore appearing on the surface, and being probably derived from the dehydration of an old lake-iron deposit. Fragments of rocks from the margins of the former lake are found surrounded by the iron oxide, and the iron itself seems to have been dissolved out from the acid igneous masses in the neighbourhood.

In view of the demand for nickel for plating, for alloying steel, and for coinage, Señor Eduardo de Habich was sent to report on the nickeliferous veins of the province of La Mar, which present practically a virgin field. His memoir (No. 11) seems encouraging, the chief ores being ullmannite and nickeline (kupfernickel), occurring mostly in veins of quartz, which may also contain both gold and silver. No. 12 has probably the widest interest for geologists in general, giving as it does the results of a visit to central Peru by Dr. Gustav Steinmann, of Freiburg-im-Breisgau, early in 1904. Señor Elmore is the author of *Boletín* No. 13, on the water-supply of the Rimac valley. It is shown that the permeable subsoil in the valley-floor, from Chosica downwards, becomes charged with a good potable water by infiltration from the River Rimac, and this is capable of furnishing a healthy supply wherever it may be desirable to tap it. The marked rise of this underground water in Callao is interestingly attributed to the obstacle furnished by the neighbouring island of San Lorenzo. The economic aspect of Señor Elmore's report is sure to be widely welcomed in a populous and practically rainless district.

The fourteenth volume of the *Berichte der naturforschenden Gesellschaft zu Freiburg-im-Breisgau* (1904) contains several papers of geological interest. A. Freiherr von Bistram's studies on the dolomitic region of the Alps of Lugano were commented on when they first appeared in separate form (*NATURE*, vol. lxi. p. 112). Walther Schiller and W. Paulcke are both concerned with the structure of the Engadine, the former giving a detailed account of the region south-east of Schuls, of which the Piz Lischanna forms the centre, while the latter examines the structure of a wider area, from Landeck to the basin of the Po.

Palaeontological papers seldom contain so much personal revelation as is to be found in Herr Georg Boehm's first section of his *Beiträge zur Geologie von Niederländisch-Indien* (*Palaeontographica*, supplement iv. Stuttgart, 1904). The splendid series of ammonites therein described, probably from a Tithonian horizon, were obtained for the most part from the collection of a postmaster of Sula Besi, and from one of "die Alfuren," the latter name being applied to any uncivilised natives. Some specimens were even extracted from concealment in the scanty clothing of the boatmen. The postmaster and his allies appear, consciously or unconsciously, to have lost touch with the true locality of their finds, and to have opened up a delusive route through the forest in Taliabu, whereby Herr Boehm was led to a spot where he found abundant belemnites and Nuculæ, but none of the highly prized ammonites. The "Alfuren-Sammlung" proves to be of unusual interest, and may perhaps grow in the course of time, if judicious sums are expended on the "uncivilised" population. The inclusion of fossils smuggled in from other places is now, however, a possibility against which it will be difficult to guard.

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Part ii. of the seventh volume of the *Transactions of the Geological Society of South Africa* (Johannesburg, 1904) bears witness to the prevalence of research in Africa in all branches of geology. Dr. Hatch contributes two papers, one in conjunction with Prof. Corstorphine, who has been drawn off from the service of Cape Colony into a more adventurous field. Mr. J. P. Johnson shows that two types of stone implements are found in the Taaibosch Spruit, the older and rougher lying beneath 15 feet of alluvium, and the newer type upon the surface. Mr. F. W. Voit furnishes a paper of general interest on the geology of German South-West Africa, in which a large series of ancient metamorphic rocks is dealt with; these are accompanied by intrusions of granite. The author urges that some of what might be regarded as ordinary contact-phenomena are here carried out on a regional scale, and must be referred to the action of pressure rather than to the invasion of the granite. The metamorphic rocks are impregnated with important deposits of copper-ore, sometimes localised in quartz veins, and sometimes spread in cloud-like masses through the schists.

In the first part of the *Jahrbuch der k.k. geologischen Reichsanstalt* for 1904 (September 15), Franz Toula describes the results of his journey to the Dobrudscha in 1892, and discusses in particular the forms of *Exogyra* met with. Dr. Petrascheck, in examining the granitic mass near Brixen, in the Adige valley, reviews the nature of Sederholm's "Myrmekite," an intergrowth of triclinic feldspar and quartz, and concludes that it is a primary product of the consolidation of the igneous magma. Dr. Ampferer's important examination of the terraces along the valley of the Inn (pp. 91-160) should be considered by all who seek to explain the topography of glaciated areas. The author finds that the terraces of gravel rest on an earlier series of terraces cut in the rock, which are at very different levels on opposite walls of the valley. He summarises his results in a series of fifty-six propositions, among them being the conclusion that the Inn valley, on the retreat of the ice, exhibited a succession of shallow basin-like excavations, which were filled in later by a continuous deposit of alluvium. These hollows, like the smaller details of the ice-erosion, were formed independently of the hardness of the rocks concerned, and Dr. Ampferer believes that the variation in the activity of a glacier as an abrading agent depends in reality on variations in the local pressure and velocity. With reduced pressure and greater velocity the same amount of erosion can be performed as with greater pressure and less velocity. The author opposes the view that rock-obstacles on the walls of a valley are inevitably worn away by the passage of glacier-ice; he urges, on the other hand, that such irregularities may be left standing out, while others are actually produced by the lack of uniformity in the forces of erosion, to which he specially directs attention.

The *Verhandlungen der k.k. geologischen Reichsanstalt*, Nos. 9-12, for 1904, continue to be rich in papers on Bohemia and Moravia, and students of petrology in the broad sense, as well as of Palæozoic and Mesozoic faunas, must endeavour to keep pace with the monthly observations furnished by Dr. Katzer, Jaroslav J. Jahn, Friedrich Trauth, and others. The Dalmatian islands also receive attention in Dr. Waagen's reports of his recent journeys.

AGRICULTURAL EDUCATION AND RESEARCH.

THE writings of Henry, Babcock, King, and others have made the University of Wisconsin familiar to English agricultural students, so that considerable interest attaches to the twentieth annual report of the experiment station, which contains a short history of the College of Agriculture, and summarises the results of twenty years' research. The college is one of the best known in the United States, and its record is typical of many similar institutions. A professor of agriculture was appointed in 1866, there was the usual attempt to teach before the materials for a course of university grade existed, and there was the usual failure. Then, when the indignation and forcible action of "some thirty representative farmers" led the regents of the uni-